

The Limits of Competition in Defense Acquisition
Defense Acquisition University Research Symposium, September 2012

Keywords: acquisition, competition, contracting, down-select, source selection

Continuous Competition as an Approach to Maximize Performance

Authors:

Ginny Wydler, The MITRE Corporation

Su Chang, The MITRE Corporation

Erin M. Schultz, The MITRE Corporation

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE SEP 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012	
4. TITLE AND SUBTITLE Continuous Competition as an Approach to Maximize Performance				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) The MITRE Corporation, 202 Burlington Road, Bedford, MA, 01730-1420				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT Research shows that continuing competitive pressure applied during development and production leads to better industry performance, often at reduced cost. However, the entrenched practice of one-time competition for an entire program life-cycle often endows the winner with a very strong monopolistic power that lasts for decades. This paper describes continuous competition as leverage to acquire more effective results. It offers an alternative method for continuous competition?Multi-sourcing with Distributed Awards?under an applicable set of conditions and an appropriate business case.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 26	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Abstract

Research shows that continuing competitive pressure applied during development and production leads to better industry performance, often at reduced cost. However, the entrenched practice of one-time competition for an entire program life-cycle often endows the winner with a very strong monopolistic power that lasts for decades. This paper describes continuous competition as leverage to acquire more effective results. It offers an alternative method for continuous competition—Multi-sourcing with Distributed Awards—under an applicable set of conditions and an appropriate business case.

Summary: When competition is continually present, industry responds with their best team and more agility, and the Government is a more informed consumer. This paper addresses continuous competition as leverage to buy more effective and affordable systems.

Introduction

Competition has always been a cornerstone of the Department of the Defense's (DoD) acquisition system. Competitive contract awards have yielded notable benefits, including reduced weapon system costs and improved contractor performance, efficiencies, and innovation. However, competition rarely continues after contract award. Instead, the winning contractor often establishes monopolistic advantages and gains "vendor lock." As a result, programs can experience cost growth, schedule delays, and average or even poor performance. By contrast, experience has shown that continuous competition can drive both incremental improvement and game-changing innovation in weapons systems acquisition.

This paper proposes that the DoD adopt an innovative form of continuous competition: "Competitive Multi-sourcing with Distributed Awards." Under this approach, DoD programs would select more than one contractor to develop, produce, and sustain a program throughout its lifecycle: a primary source and one or more secondary sources that contribute a lower level of design development and work share.

As envisioned, this approach offers multiple benefits to the DoD.

- Having multiple contractors would provide programs with an "insurance policy" in the event that the primary contractor fails to perform adequately. Thus, it would reduce single points of failure—a critical advantage in today's increasingly complex and interdependent acquisition environment.
- The existence of one or more alternative providers can spur the prime contractor to maintain a high level of performance by maintaining the pressure of price competition throughout the system lifecycle. It would also help prevent monopolistic behavior by the primary contractor.

The Limits of Competition in Defense Acquisition
Defense Acquisition University Research Symposium, September 2012

- The risks inherent in contract transition would be minimized by the availability of a second source that is already knowledgeable about the day-to-day operations of the program. Should the prime contractor fail to meet DoD expectations, the second source could quickly ramp up to fill the primary contractor's obligations.
- The expanded opportunity to win a share of a large contract should stimulate additional companies to develop their capabilities and become credible competitors. This would address widespread concern about the shrinking Defense Industrial Base, in which four companies have dominated the market since 1999.

Competitive Multi-sourcing with Distributed Awards would have particular benefits for certain types of programs, including those that have applied dual sourcing successfully in the past. It would also enable the DoD to take advantage of two product designs rather than choosing a single solution and forgoing the features of a promising alternative. Engaging a low-level second source early in the program could generate high pay-off in production. Finally, programs with high cost overruns could apply Competitive Multi-sourcing with Distributed Awards to engage a low-level second source in developing additional technology. This would encourage both contractors to refine and mature their technical designs, thus permitting better cost analysis and cost containment. This paper describes the current defense contracting environment, and shows how the practice of awarding single contracts has led to unnecessarily high costs and poor performance. It then uses historical examples to illustrate the benefits of a dual-source approach, and presents examples of continuous competition. Finally, the paper presents Competitive Multi-sourcing with Distributed Awards as a recommended form of continuing competition, and examines the advantages that such an approach would bring to the DoD.

Competition in Defense Contracting

Both government and industry have long recognized the benefits of competition in improving performance and reducing costs. The value of competition has been incorporated into every major piece of legislation on acquisition reform and is continually touted in political speeches and public engagements. However, the vast majority of DoD programs continue to rely on a single-provider acquisition approach and spend most of their lifecycles without real and enduring competition. As a result, too many DoD acquisition programs fail to achieve their cost, schedule, and performance objectives.

The absence of a continuous competitive force, such as a credible industry competitor, may contribute to this situation. Once a contractor is chosen to develop a major new system, the DoD is locked into a relationship with that contractor that could last 20 years or more (Arena & Birkler, 2009). As a result of this de facto monopoly, the DoD has little opportunity to obtain broad insight regarding engineering changes or technology upgrades, other than from the prime contractor, and that contractor may not be entirely objective.

Congress enacted the Competition in Contracting Act of 1984 and later reaffirmed its importance by passing the Weapon Systems Acquisition Reform Act (WSARA) of 2009. Under this new legislation, Congress mandated that the Secretary of Defense require that each major defense acquisition program (MDAP) include in its acquisition strategies measures to ensure competition, or the option of competition, throughout a program's lifecycle (Public Law 111-123 2009). Dr. Ashton Carter, then Under Secretary of Defense for Acquisition, Technology, and Logistics, emphasized competitive contracting as one of the five "affordability tools" to be utilized within the DoD in his "Better Buying Power" memorandum of 2010 (Carter, 2010).

The Limits of Competition in Defense Acquisition
Defense Acquisition University Research Symposium, September 2012

With recent declining budgets, the competitive environment is at risk because the DoD lacks the funds to invest in making companies capable of challenging the top defense contractors.

In spite of the attention focused on improving competition, major systems acquisitions continue to experience problems in development and production. Fewer than half of the programs in DoD's 2010 MDAP portfolio meet the established performance metrics and cost-performance goals agreed to by the DoD, the Office of Management and Budget, and the Government Accountability Office (GAO) (GAO-11-233SP 2011). According to a study by the Center for Strategic and International Studies (CSIS), 32 percent of the programs awarded competitively experienced cost overruns, amounting to \$19 billion (Hofbauer, 2011). A recent GAO study on "Trends in Nunn-McCurdy Cost Breaches for Major Defense Acquisition Programs" identified 74 breaches involving 47 major programs from 1997 to 2011 (GAO-11-295R 2011). Breaches occur when unit costs increase by at least 25 percent over the current baseline estimate or at least 50 percent over the original baseline estimate. GAO's analysis showed that nearly half of Nunn-McCurdy breaches occurred after a production decision had been made—when a program has fewer options for restructuring. For example, the DDG-1000 Destroyer and F-35 Joint Strike Fighter (JSF) were required to recertify and restructure in 2010. The Air Force's Evolved Expendable Launch Vehicle (EELV) breached in May 2012, exceeding its original projected per-unit cost by 58 percent.

Recent DoD guidance and oversight suggest a need for more focused investment of funds to promote better design decisions and performance outcomes in acquisitions. DoD Instruction 5000.02 of 2008 now requires a materiel development decision (MDD) before a program enters the acquisition process. As a result, programs must invest more funds in alternative design analysis before entering development or production. WSARA emphasizes investment in

competitive prototyping and trade-off analysis before development starts. GAO reports (GAO Report 12-400SP 2012) and the Better Buying Power memorandum emphasize investing in design, development, and production to mitigate performance failure. Maintaining competition throughout the system lifecycle by investing in alternative products can help meet the government's cost, schedule, and performance goals and at the same time expand the marketplace of qualified firms.

The Shrinking Competitive Marketplace

Following the large increase in defense acquisition dollars during Operation Iraqi Freedom, the DoD now faces a period of declining budgets. This pattern was last seen at the Reagan era defense build-up in the 1980s and the drawdown at the conclusion of the Cold War in the 1990s. Both patterns were marked by the significant consolidation of the Defense Industrial Base, making acquisition through competition more difficult to realize.

Many capable firms competed for contracts in the 1980s and dual sourcing was used as an acquisition strategy for several weapons systems. Today, dual sourcing is rare in weapons systems procurements because the marketplace contains fewer suppliers and the DoD has less investment dollars to develop a second source. The top four contractors delivering defense products—Lockheed Martin, Boeing, General Dynamics, and Raytheon— have not changed from 1999 to 2010 (CSIS 2011).

In an interview with Reuters on February 8, 2011, Deputy Secretary of Defense Ashton Carter expressed concern about another round of mergers in the defense contractor base, emphasizing the need for a strong, technically vibrant defense industry. He suggested several strategies to nurture such an industry, such as increased attention to more dynamic lower tier companies and greater opportunity for entry of smaller firms and start-ups.

The Limits of Competition in Defense Acquisition
Defense Acquisition University Research Symposium, September 2012

In fiscal year (FY) 2011, the DoD reported that it spent a total of \$374 billion on contracts for products and services and research, and awarded 58 percent of its contracts competitively (GAO 12-384 2012). However, products alone represented only 41 percent of competitive bidding, and major weapons systems accounted for a large part of this number. The DoD had 96 MDAPs in 2011, with an overall 2011 development and production cost of \$170 billion.

The following review of several defense products illustrates how competitive practices have shifted since the 1980s.

Contracts for aircraft are competitively awarded to a single bidder, with little evidence of continued competition during the program lifecycle. This approach has persisted since the 1980s, largely because of proprietary data, high barriers to entry, and an unwillingness to change contractors once a design decision has been made. The number of competitors has decreased drastically since the sharp reduction in defense spending during the mid-1990s. Today, only a few companies can vie for aircraft contracts, and the competitions most often result in a single award. For example; the Air Force recently made a hotly contested (and controversial) single award for replacement of the KC-135 tanker, covering production of 179 aircraft at a cost of \$35 billion, and the Navy P-8 Poseidon is being developed and produced under a single award for 117 aircraft. Even though GAO found that more than half of aircraft programs are known to experience design problems and cost growth (GAO-11-295R 2011), neither program involves competition from an alternate source or lower-tier company.

Similarly, contracts to build ships are competitively awarded to a single contractor because of the high investment in infrastructure and low production volume. In the 1980s ship production was high, and six commercial shipbuilders accommodated the world reach of a

planned 600-ship Navy. Today, the fleet is smaller (fewer than 300 ships), and there are only two major commercial shipyards (General Dynamics and Huntington-Ingalls). Shipbuilding has suffered extensive program stretch-out due to reduced budgets and cost overruns. Aircraft carriers take four years to complete; each one (e.g., the new Gerald Ford Class) costs \$12 billion to develop and \$14 billion to build. Given that level of investment in time and money, it would be difficult to engage a second shipyard to provide continuous competition.

Historically, engine development and production have been highly competitive, due to the high volume and advancing propulsion technology in both the commercial and military market. During the 1980s dual sourcing was used very successfully in this market. The “engine wars” for multiple military aircraft drove prices down and introduced much-needed improvements in power and fuel efficiency. For example, in the 1980s, the Air Force added General Electric as a second source with Pratt & Whitney for the F-15 and F-16 fighter engines, saving \$2–3 billion over the 20-year lifecycle and doubling the reliability per 1000 engine flight hours (Gansler, 2009). Each year, the award for the production quantity was split between the two sources. The additional benefit during the 1980s was that GE invested its own money to develop and deliver its engines. In the twenty-first century, contracts for engines have moved away from this dual-source environment. The DoD decided to cancel the second source for the F-35 JSF because the development costs were too high (\$2.9 billion).

According to various studies, dual-sourcing for 14 tactical missile programs between 1975 and 1995 saved 20 percent over the lifecycle. The Navy Tomahawk missile made annual split awards, saving over \$270 million and improving performance reliability from 80 percent to 97 percent. The DoD made only a minor investment to develop the second source (2 percent of production costs) (Gansler, 2009). Today, missile programs have returned to single awards, and

many experience design issues and cost overruns. The cost of the Army Patriot PAC-3 increased by 77 percent, from about \$3.9 billion in 1994 to about \$6.9 billion in March 2000, due to design issues and program stretch-out (GAO-11-295R 2011). The Pentagon's Missile Defense Agency (MDA) has spent nearly \$56 billion researching and deploying various systems since 2002; GAO estimates that MDA contractors overran budgeted costs by \$152.4 million in fiscal year 2008 alone.

Subsystems and components have also had success with continuous competition. The Joint Direct Attack Munition (JDAM) program conducted dual-sourcing competitions in the late 1990s and 2000s to effectively control unit costs. The Navy has used multiple sources for its sonobuoys since the 1980s, but now awards are made to single entities. Recently, the Navy awarded a major contract for over 50,000 passive sonobuoys to ERAPSCO, a joint venture of Sparton Corporation and Ultra Electronics (USSI) (Business Wire News, June 7 2012). In December 2011, the Navy had awarded a \$25 million contract to Signal Systems Corporation under the SBIR program to explore new underwater measurements, which could provide an alternative to the sonobuoys. The U.S. Army Forward Looking Infrared (FLIR) Program Office considered bringing in additional sources in 2004 to 2006 to motivate the primary manufacturer to build a limited number of prototypes. Although the prototypes never went into production, the effort did provide leverage to control the technology and price in subsequent design and production units.

Competitive Acquisition Approaches

The Federal Acquisition Regulation (FAR) and the Defense Federal Acquisition Regulation Supplement (DFARS) contain regulatory and policy guidance for implementing

competitive acquisitions. With limited exceptions, contracting officers are required to promote “full and open competition”: that is, ensure that all responsible sources may compete.

Procurement Methods That Support Competition

The FAR recognizes several competitive acquisition methods. Awards are made to a single winner or multiple sources, thereby influencing the presence of competition for the remainder of the life cycle. Dual sourcing and leader-follower are two established acquisition methods used to implement continuous competition throughout the lifecycle. DFARS (Subpart 207.1) recognizes dual sourcing as a viable approach to acquisition. This method creates competitive pressure through having two or more sources deliver systems that meet requirements. Dual sourcing has been used primarily by programs with reasonable start-up costs that produce large quantities of an item at the least total cost. Under leader-follower sourcing, described in FAR subpart 17.4, an otherwise sole-source “leader” contractor provides “assistance and know-how” to a “follower” contractor to achieve the benefits of multi-sourcing.

DoD agencies use several other techniques to bring alternative prices to the development or production phase of a lifecycle. Military depots use both organic and contracted industry services for maintenance and repair to provide a dual source and alternative pricing. Government laboratories offer competitive cost comparisons by evaluating technology against industry designs and validating costs for engineering change proposals. DoD uses independent verification and validation (IV&V) contracts to conduct independent reviews of aspects of a program and give the acquiring organization leverage in negotiating with potential contractors. The Small Business Innovation Research (SBIR) program can add value by exploring new technology and costs. The DoD Broad Agency Announcements call for alternative source data for better engineering design decisions and cost estimating.

Commercial Competitive Development Model. This open-market strategy encourages all contractors to develop products at their own cost. The government has the option to buy these products at a per-unit cost once the items are fully developed and ready for production. Firms are willing to fund the development if they believe the government will choose to buy their products at a price and quantity that enables them to recoup costs and earn a reasonable profit in the production phase. This approach is best suited to information technology systems that allow contractors to develop applications on an existing infrastructure. However, it can also be used in developing components on top of open hardware platforms. For instance, airframes, ships, and vehicle classes present a standard platform, but competition could occur for the various subsystems (e.g., avionics, navigation, and fire control systems).

Competitive Orders (Indefinite Delivery/Indefinite Quantity). The government awards contracts to multiple, qualified contractors to meet a broad set of requirements. The government negotiates pricing, terms, and conditions with each vendor. The multiple awardees vie for task/delivery orders in a post-award competitive environment, keeping competitive pressures in play throughout the life of a contract. This strategy works best when requirements can be broken into several manageable tasks that different contractors can perform independently over a period of time.

Competitive Dual Sources. The government fully funds two contractors to execute their designs or solutions to meet a need. The contractors fully develop and produce their designs, thus providing the government with two viable solutions. The two sources continuously drive down prices while also improving the performance and reliability of their products over time. Of the continuous competition strategies, this approach requires the greatest upfront investment by the

government, but it also creates the most competition and the highest probability of meeting program mission needs on schedule.

Competitive Multi-Sourcing with Distributed Awards. Under this new approach, the government awards contracts to two (or more) sources, with a primary contractor receiving the majority of funding. A second contractor is selected to create a continuous competitive environment and to provide a viable back-up should the primary contractor fail to meet program objectives. The next section of this paper explores this approach in greater detail.

Competitive Multi-sourcing with Distributed Awards

Competitive Multi-sourcing with Distributed Awards offers an alternative to full dual sourcing, enabling the government to maintain multiple viable sources without having to “fully” fund or “share” work among competitors. Under this approach, the second contractor does not deliver an equal share, but receives sufficient funds to mature an alternative design, and bring competitive pressure into the environment. This can provide the government with a viable alternative contractor if the prime underperforms.

Definition

Under this model, the government awards the majority of funding to a prime contractor, and at the same time provides a smaller amount of funding to a secondary source. Keeping a second source under contract at even a low level (e.g., 5–10 percent of prime contract costs) maintains significant competitive pressure on the prime contractor by greatly reducing the barriers of entry into the program (i.e., it lowers the costs of switching if the prime does not perform satisfactorily). It also allows the second source to refine and mature its technical

approach and gain familiarity with the program's operations. The cost of implementing this competitive multi-sourcing approach can be relatively small compared to the benefits of competition that it provides.

The DoD can apply this approach in several ways to maintain continuous competition in all stages of the acquisition lifecycle.

Percentage-based Distributions. Under this strategy, a set percentage of funding is allocated to each source. For example, Vendor A submits the best offer and receives the majority of funding (e.g., 90 percent) as the primary source. Vendor B submits the second-best offer and receives a smaller percentage of funding (e.g., 10 percent) to partially develop its design or to work on a particular subset of the contract requirements. This strategy keeps a second viable source in play during the prototyping, development, production, and sustainment phases, which will provide competitive pressure to motivate the primary contractor.

Full Development with Scaled Production. Under this strategy, two or more contractors are fully funded to develop prototype products. After the two prototypes have been delivered, the government selects one contractor for full-scale production and awards a contract for limited production to the second source. This strategy can work best for products to minimize risk during the design phase of the program.

Next Increment Prototype Model. Under this strategy, the DoD uses a primary source to maintain engineering capability for the current production unit. A lesser amount of funding is provided to a secondary source to build a prototype for the next program increment. In addition to getting a head start on the next spiral of development, this mechanism allows the DoD to introduce a second capable source and position it to compete with the prime for the next program increment.

Partial Contractor-funded Development Model. Under this strategy, the DoD caps the amount of development funding to a second contractor (e.g., 30 percent of proposed costs). The contractor has the option to fully fund the development of the proposed design. This gives the contractor the potential to recapture these development costs during the production phase if the government selects the second contractor's design for production.

Conditions for Use of Competitive Multi-sourcing with Distributed Awards

Certain conditions favor the successful application of Competitive Multi-sourcing with Distributed Awards during development of contracting strategies for acquisition programs. These conditions are derived from the historical perspective and lessons learned addressed earlier in this paper.

- High quantities with economic production rates. This condition can apply in both development and production phases of the acquisition. Competition can be maintained in the production phase in situations where investment costs are low, production accounts for the majority of the costs, and contractors go head-to-head for high-volume returns. Maintaining a second source in the development phase will work best when the government declares the intent to maintain dual sources in production.
- Credible competition. The second source must represent effective leverage and alternatives to the single-source environment. This situation can occur in an environment where industry competes on a regular basis, and the prime contractor recognizes the second source as a peer competitor. The contracting arrangement must also facilitate alternating from one source to the other.
- Sufficient technical knowledge in industry. Both the prime and secondary source must already have enough knowledge and intellectual property to offer credible competitive

products. At the very least, the secondary source must have adequate technical and manufacturing readiness to be viewed as legitimate competition. The contract and program reporting mechanism must track the costs of both competitors in order to close the design maturity gap and improve the Technology Readiness Level (TRL).

- Effective cost-benefit analysis. While it may cost 5–10 percent of the program budget in the short term, in depth cost-benefit analysis has the potential to save far more over the long term. The analysis can consider items such as reduced barriers to program entry, lower costs for switching between contractors, and the benefits of technology development and design maturity. The business case must also include budget and schedule considerations. Executing an acquisition strategy and keeping a second source in the competition increases the likelihood that the prime contractor will perform closer to budget and schedule.

Challenges

WSARA, “Better Buying Power” tenets, and GAO reports recommend prototyping and maturing designs in a price-competitive environment. An acquisition strategy of this kind does bring several challenges. First, the DoD has declining discretionary funding. However, investing in alternative sources will allow better design and technical decisions during the program lifecycle. Second, writing an additional contract for the second source creates an administrative burden for the contracting staff. Still, the ability to control engineering design changes can mitigate the risk of Nunn-McCurdy program breaches, which can impose inordinate administrative costs on a program office. Third, most program offices prefer to stay with the same contractor rather than incur the time and expense of new competitions. A second source

could be a controlling factor for cost growth and schedule creep. The largest hurdle to overcome is creating an industrial environment that encourages competitive forces to invest in this acquisition approach. The DoD can meet this challenge by providing the potential for increased business in previously closed market.

However, the challenges do not involve only cost, budget, and resource constraints. The government must take various actions to minimize the risks of adopting this new and innovative method of continuous competition.

- Ensure the second source poses an actual threat to the prime source. With the shrinking industrial base, only a handful of companies now compete for major weapons systems. The second source must be credible and known in the market. The government can identify a viable second source in various ways, such as by evaluating commercial products or considering a company's level of independent research and development to complement government investments.
- Coordinate the activities between the two sources to ensure delivery of products and solutions at set program milestones. Both contractors must be effectively evaluated along the same path or according to the same milestones, taking their different solutions into account. The challenge is to coordinate activities for both contractors, such as testing, to ensure synchronization.
- Close the maturity gap at the same rate and TRL. The second source should have a relatively mature product, or should invest in developing such technology on its own. Any newcomer to the industry or the market will experience technology lag and will therefore not pose any competitive threat to the prime contractor.

- Recognize and accept the fact that cost savings will not be realized until the production phase. A business case is critical to identify the long-term benefits of competition. It may be difficult to clearly articulate savings without empirical data, but benchmarking historical successes and establishing clear measures for technology maturity levels will help quantify the benefits.
- Recognize supply chain risks. Multiple prime sources can impact the number and type of suppliers. Ensuring that there is a sufficient and security-assured supply chain for the prime and the second source will be a critical piece for delivery in a competitive environment.

Benefits and Measures of Success

In this period of fiscal austerity, funding a second source may appear to be a luxury. To maximize the advantages of continuous lifecycle competition, the DoD needs to adopt a dual- or multi-provider strategy from the outset of the program planning process. While continuous competition approaches may require greater upfront funding, they have the potential to save far more over the long term and to provide additional, non-monetary program benefits.

Benefits

Dual sourcing has already proven effective in reducing costs, as evidenced by the engine wars, referenced earlier. According to a 2001 study by the RAND Corporation (RAND 2001) the introduction of a second source during the production of the Tomahawk missile led to estimated savings of \$630 million, while improving the missile's reliability from approximately 80 percent to 97 percent. The same study also revealed that the ten DoD aircraft programs that involved no

competition during the production phase experienced an average 46 percent increase in cost over the original budget.

Continuous competition places competitive pressure on the prime contractor through the presence of alternative sources. The most significant benefits include:

- Allowing a second source to refine and mature its technical design. WSARA, GAO, and DoD all recognize the need for better investments in engineering design and technology to improve decision making in choosing a contractor. Furthermore, problems with engineering design caused the majority of Nunn-McCurdy breaches. The additional design maturity would produce alternative cost estimates for Engineering Change Proposals (ECPs) to enable better cost analysis and cost containment (GAO 11-295R 2011).
- Maintaining the pressure of price competition. The FAR address the critical nature of competitive environments and the importance of maintaining the “spirit” of competition throughout the lifecycle. Distributed competition would create an environment of competition for the prime manufacturer, even though that competition would not be at the full, traditional dual-source production level.
- Having a viable second source available as insurance for transition in case of performance failure by the prime. A second contractor, if perceived as a viable alternative, can prevent monopolistic behavior by the primary contractor. The average time to compete a major program is twelve to eighteen months, and, quite often, that does not include the critical transition time necessary for the new contractor to become fully functional.

Measures of Success

Recent program reviews by DoD and GAO highlighted three main areas of concern: cost growth, schedule slip and performance failure. The government could determine the success of Competitive Multi-sourcing with Distributed Awards by measuring:

- The ability to contain costs, measured against statistical cost growth percentages over the lifecycle of selected programs, and benchmarked with CSIS, GAO, and Nunn-McCurdy cost figures.
- The ability to reduce known causes for schedule slips in production, such as a lack of alternate sources of critical suppliers or unplanned engineering changes.
- The ability to improve performance by achieving or exceeding technical performance against key performance parameters that are a part of program requirements.

Implementation

The DoD can apply the following guidelines in adopting Competitive Multi-sourcing with Distributed Awards as an alternative to standard dual sourcing:

- Apply the method under a clear set of conditions and using a business case where the value of an additional source will improve performance and control costs.
- Evaluate the cost of the additional source as an investment to improve decision making and enhanced life-cycle cost estimating.
- Develop risk/reward factors that clearly incentivize both the prime and the second source contractor.
- Include clauses in the contract specifically to accommodate technology sharing and ease of transition from one contractor to another.
- Engage industry through clear direction and defined outcomes.

The DoD should consider Competitive Multi-sourcing with Distributed Awards for the following products and programs:

Products with known dual sourcing success. In the past, dual sources have achieved success in developing and producing engines because of the large volume and economic production rates. High costs prevented the F-35 JSF program from pursuing a second engine source. This program would be a good candidate for Competitive Multi-sourcing with Distributed Awards, allowing the Air Force to retain a second contractor at a lower level to mature the design and become a potential production source.

Products in highly competitive environments that resulted in a single award. The recent competition for the Air Force Tanker resulted in a single award. The selected solution was rated at TRL 6, so further design and development will occur before full production. Keeping a second source in play would leverage technology brought to the table during the competition and could enable higher TRL levels at a faster pace.

Programs with high cost overruns. The EELV is under Nunn-McCurdy review because of skyrocketing costs. The Air Force plans to introduce competition, currently under a single-award joint venture contract, by 2018 (*Aviation Week*, November 2011). Applying Competitive Multi-sourcing with Distributed Awards to this program with a low-level second source would allow development of additional technology and would contain costs.

Recommendation

In 1954, President Dwight D. Eisenhower's Secretary of Defense, Charles Erwin Wilson, notably used the phrase "bigger bang for the buck" to capture the concept of greater worth for the money used. The phrase perfectly summarizes the benefits of continuous competition and

The Limits of Competition in Defense Acquisition
Defense Acquisition University Research Symposium, September 2012

Competitive Multi-sourcing with Distributed Awards. DoD should adopt Competitive Multi-sourcing with Distributed Awards as an alternative method for continuous competition and dual sourcing. The DoD should redefine competition so that it is no longer viewed merely as an upfront activity limited to the contracting process. Applying continuous competition to the right set of DoD acquisition programs could replicate proven successes at a far broader scale, yielding significant benefits to our nation's warfighters as well as to the program offices that deliver capabilities to them.

Authors

Su Chang has 10 years of experience with both government and commercial contracting, specializing in defense systems acquisition. She has been certified as DAWIA Level III in Contracting. She is currently a Principal Analyst and Group Leader at The MITRE Corporation.

Erin M. Schultz has over 25 years of contracting experience with both federal government and industry, specializing in information technology acquisition. She is currently an Associate Department Head and Contracting Competency Lead at The MITRE Corporation.

Ginny Wydler has more than 25 years of experience in acquisition and contracting, both government and commercial. She is a Certified Professional Contracts Manager (CPCM) and a Fellow of NCMA. She is currently a Principal Analyst at The MITRE Corporation.

References

- 111th Congress. 2009. *Public Law 111-123 Weapon System Reform Act of 2009*, Washington, D.C.
- Arena, Mark & Birkler, John. 2009. *Determining When Competition is a Reasonable Strategy for the Production Phase of Defense Acquisition*. RAND, Santa Monica, CA.
- Carter, Ashton. 2010. *Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending*. Office of the Under Secretary of Defense, Acquisition Technology and Logistics, Washington, D.C.
- Center for Strategic International Studies, May 2011, *Defense Contract Trends*, Washington DC.
- Department of Defense. 2009. *Competition Report for FY 2009*. Office of the Secretary of Defense, Washington, D.C.
- Gansler, Jacques. 2011. *Democracy's Arsenal: Creating a Twenty-First-Century Defense Industry*. Cambridge, MA. MIT Press.
- Gansler, Jacques. 2009. *Competition in Defense Acquisitions*. Center for Public Policy and Private Enterprise, School of Public Policy, University of Maryland.
- Government Accountability Office, March 2011, *Report GAO 11-233SP, Assessments of Selected Weapon Programs*, Washington DC.
- Government Accountability Office, March 2011, *Report GAO 11-295R, Trends in Nunn-McCurdy Cost Breaches for Major Defense Acquisition Programs*, Washington DC.
- Government Accountability Office, March 2012, *Report GAO 12-384, Defense Contracting*, Washington DC.
- Government Accountability Office, March 2012, *Report GAO 12-400SP, Defense Acquisitions Assessment of Selected Weapon Programs*, Washington DC.
- Hofbauer, Joachim et. al. 2011. *Cost and Time Overruns for Major Defense Acquisition Programs*. Center for Strategic and International Studies, Washington, D.C.
- Kendall, Frank. 2012. *The Optimal Program Structure*. Article, AT&L Magazine, July/August 2012 Edition, Ft. Belvoir, VA.

The Limits of Competition in Defense Acquisition
Defense Acquisition University Research Symposium, September 2012

Meyers, Dominique. 2002. *Acquisition Reform: Inside the Silver Bullet – A comparative analysis –JDAM vs. F-22*. Acquisition Review Quarterly.

RAND Corporation. 2001. *Assessing Competitive Strategies for the Joint Strike Fighter – Opportunities and Options*. Santa Monica, CA.

Reuters. 2012. Pentagon Open to Mergers, But Not at Very Top. *Wall Street Journal*, New York, NY.

Schenk, Robert. 2011 *The Theory of a Few Sellers*. Website:
<http://ingrimayne.com/econ/Monopoly/Oligopoly.html>

The Limits of Competition in Defense Acquisition
Defense Acquisition University Research Symposium, September 2012